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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/000,330
Filing Date: May 20, 1998
Appellant(s): NAKAMURA ET AL.

Ashley I. Pezzner
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed Feb. 06, 2006 appealing from the Office action mailed Jan. 19, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 16, 21, 24-30, and 35.

Claim 26 has been amended subsequent to the final rejection.

Claims 1-15, 17-20, 22, 23, and 31-34 have been canceled.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after the final rejection mailed on May 3, 2004, filed on Aug. 6, 2004, has been entered. Prosecution was reopened and a final rejection was mailed on Jan. 19, 2005.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because the brief does not refer to the specification by page and line number where the specification discloses the limitations "optionally, a diene monomer" recited in claims 16 and 28 and "optionally, (iii) a diene" recited in claims 26. The examiner notes that antecedent basis for said limitations is found in the originally filed at page 3, line 31, and page 7, lines 7-9.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,292,609	Yoshikawa et al.	03-1994

5,179,171 Minami et al. 01-1993

Aldrich Catalog (1994), Aldrich Chemical Co., Inc., p. 1063.

Whelan, T., Polymer Technology Dictionary, Chapman & Hall, NY (1994), p. 487.

Kirk-Othmer Encyclopedia of Chemical Technology, 4th edition, Vol. 13, John Wiley & Sons, NY (1995), pp. 717-719.

(Cited only in rebuttal to applicant's arguments to show that the term "hydrocarbon resin" includes low molecular weight thermoplastic polymers synthesized from olefinic monomers. See final rejection mailed on May 3, 2004, paragraph 21, lines 10-19.)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

I. 35 U.S.C. 112, first paragraph, rejection

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16, 21, 24, 25, 28, and 35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Instant claims 16 and 28 and claims dependent thereon recite that the polyolefin resin having a cyclic structure is a copolymer derived from an alpha-olefin and an alicyclic compound having "one double bond."

The originally filed specification does not provide an adequate written description of said alicyclic compound having "one double bond" as recited in the instant claims. The originally filed specification at page 4, lines 32-34, discloses a copolymer of an alpha olefin with "an alicyclic compound having a double bond, such as cyclohexene or norbornene." There is no disclosure of the broadly recited subgeneric species "alicyclic compound having one double bond" as recited in the instant claims. Nor is there any appreciation in the originally filed specification for the broadly recited "alicyclic compound having one double bond." The subgeneric species recited in the

instant claims includes not only the disclosed cyclohexene and norbornene monomers but other non-disclosed alicyclic compounds having one double bond that are not cyclohexene or norbornene, such as cyclobutene, tetracyclododecene, cyclopentene, etc. The two particular disclosed alicyclic compounds do not provide an adequate written description of the broad subgeneric species "alicyclic compound having one double bond" recited in the instant claims.

II. 35 U.S.C. 103(a) rejection over US 5,292,609 (Yoshikawa) combined with US 5,179,171 (Minami), as evidenced by the Aldrich Catalog, page 1063, and Polymer Technology Dictionary, page 487.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16, 21, 24, 26-30, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,292,609

(Yoshikawa) combined with US 5,179,171 (Minami), as evidenced by the Aldrich Catalog, page 1063, and Polymer Technology Dictionary, page 487.

Yoshikawa discloses a toner that comprises a colorant, such as carbon black, a vinyl-based binder resin, a wax comprising two particular polyolefin waxes, and a charge control agent. Col. 2, lines 1-7, and examples 1-3 at cols. 7-8. Yoshikawa discloses that the colorant may also be phthalocyanine blue or quinacridone. Col. 4, lines 41-43. These colorants meet the colorant limitations recited in instant claims 16, 26, and 28. Yoshikawa discloses that said toners may be used in the electrophotographic copying machine shown in Fig. 1, wherein the toner image, which is obtained by developing an electrostatic latent image with a toner, is fixed to a paper sheet with a heated roller **54**. See Fig. 1, and col. 6, lines 18-57. Yoshikawa discloses that said toner has excellent properties in terms of anti-offset, conservation, fluidity, and fixation. Col. 1, lines 64-68.

Yoshikawa does not disclose that the vinyl-based binder resin is a polyolefin resin having a cyclic structure as recited in the instant claims. However, Yoshikawa discloses that the vinyl-based binder resin can be ethylene-based copolymers or alicyclic hydrocarbon resins. Col. 4, lines 24 and 30.

Minami discloses a random copolymer resin having a cyclic structure that is within the compositional limitations recited in the instant claims. Minami discloses that the low molecular weight random copolymers can be used as electrophotographic toners. Col. 15, lines 58-59, and col. 16, line 2. The random copolymer is obtained from ethylene and at least one cycloolefin, such as bicyclo[2,2,1]hept-2-ene, which is incorporated in the polymer chain without ring opening. Col. 4, line 30, to col. 8, line 5, and especially col. 6, line 50. The random copolymer comprises saturated alicyclic groups, and is thus within the compositional limitation recited in claim 16. Ethylene and the cycloolefin are within the limitations recited in claims 16, 21, and 28. A copolymer of ethylene and bicyclo[2,2,1]hept-2-ene, which is another name for norbornene (see Aldrich Catalog, page 1063), meets the copolymer recited in instant claims 26, 29, and 30. Minami discloses that said copolymer is formed by copolymerizing ethylene and the cycloolefin in the presence of a catalyst. The catalyst comprises a soluble vanadium compound and an aluminum alkyl compound. Col. 8, line 11, to col. 9, line 50. Such a catalyst is recognized as a Ziegler-Natta catalyst system. See Polymer Technology Dictionary, page 487. Thus, Minami's copolymer is made by a Ziegler catalyst as recited in instant claim 27.

Minami teaches that its random copolymers have excellent transparency, thermal resistance, dielectric properties, and mechanical properties. Col. 4, lines 16-21.

Minami further discloses that its random copolymer resin having a cyclic structure may be modified by grafting thereto a monomer having an alpha, beta-unsaturated carboxylic acid group, such as acrylic acid. Col.17, lines 40-43 and 58-67. The grafted random copolymer resin having a cyclic structure meets the compositional limitation recited in instant claim 24/16. According to Minami, the grafted random copolymer has the same excellent properties as the non-grafted random copolymer and also excellent adhesion to metals and synthetic resins and good compatibility with other resins. Col. 17, lines 46-50.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Minami, to use the random copolymer obtained from ethylene and a cycloolefin, such as norbornene, or the modified random copolymer obtained from ethylene and a cycloolefin, such as norbornene, grafted with an alpha-beta-unsaturated carboxylic acid monomer, such as acrylic acid, both taught by Minami, as the vinyl-based binder resin in the toner disclosed by Yoshikawa. That person would have had a reasonable expectation of successfully obtaining an

electrophotographic color toner having the properties disclosed by Yoshikawa, as well as excellent transparency.

(10) Response to Argument

I. 35 U.S.C. 112, first paragraph, rejection

Appellant "believes that the reasonable interpretation and support for having one double bond can be found at page 4, four lines from the bottom of the page 'compound having **a** double bond, **such as** cyclohexene or norbornene. [sic]'" (emphasis in the original). Appellant asserts that the "term 'a' indicates only one, therefore the phrase compound having a double bond means that there is only one double bond," and that the "phrase 'such as cyclohexene and norbornene' evidences that only one double bond is preferred because both . . . have only one double bond."

However, the disclosure of a "compound having a double bond," when given its broadest and reasonable interpretation, is not limited to compounds having one double bond, but includes compounds having one or more double bonds than one double bond. The disclosure "such as cyclohexene and norbornene" (emphasis added) appears to identify preferred embodiments, rather than the exclusive class of "alicyclic compounds having [only] one double bond." The originally filed specification does not

expressly define the term "a double bond" as referring to only one double bond. For the reasons discussed in the rejection, the originally filed specification does not provide an adequate written description of the broad subgeneric species "alicyclic compound having one double bond" recited in the instant claims.

II. The rejection under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa combined with Minami as evidenced by the Aldrich Catalog and the Polymer Technology Dictionary

Claims 16, 21, 24, and 35

Appellant asserts that there is no reason to pick the ethylene-based copolymers or the alicyclic hydrocarbon resins from the "group of 18 examples of binders" taught by Yoshikawa. Brief at page 9, lines 14-16. Appellant appears to imply by emphasizing the styrene-based resin example in Yoshikawa that Yoshikawa prefers styrene-based resins as the toner binder. Brief, page 9, lines 8-13. Appellant argues further that there is no reason to pick the field of electrophotographic toners from the "forty different fields disclosed" by Minami as applications of its ethylene-cycloolefin copolymers. See the Brief at page 12, lines 2-4. (Appellant's attempts to inflate the number of examples by including subclasses of polymers disclosed by Yoshikawa and the number of utilities by

incorporating the high molecular weight polymers utilities disclosed by Minami are noted but dismissed as irrelevant. In particular, Minami makes no suggestion that the high molecular weight copolymers can be used in an electrophotographic toner. See Minami, col. 16, lines 5-14.) The examiner's rejection, according to appellant, is based on hindsight, due to an alleged lack of direction to choose the particular toner binder resin, i.e., the ethylene-based copolymers or the alicyclic hydrocarbon resins, from Yoshikawa, and an alleged lack of direction to choose the particular application for the ethylene-cycloolefin copolymers taught by Minami. Brief at pages 12-13.

Appellant's arguments are not persuasive for the following reasons. The properties required of polymers suitable for toners are well known, and are summarized by Yoshikawa in the Background of the Invention. See Yoshikawa at col. 1, lines 11-32, which discloses the thermal and mechanical properties required for electrophotographic toners. Moreover, the particular class of "vinyl-based polymer synthetic resin" (see Yoshikawa claim 1) required by Yoshikawa for its invention is not critical, as shown by the list disclosed by Yoshikawa at column 4 and painstakingly repeated by appellant at pages 8-9 of the Brief. See also Yoshikawa claim 1, which recites a toner comprising "a vinyl-based polymer synthetic resin," which is

broader than the preferred embodiment. In any event, although Yoshikawa appears to prefer styrene-based resins as its toner binder resin, the disclosure of a reference is not limited to its examples, or to its preferred embodiments. Rather, a reference is relevant for all that it teaches. In re Heck, 216 USPQ 1038, 1039 (Fed. Cir. 1983). "[I]n a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'" Merck & Co. Inc. v. Biocraft Laboratories Inc., 10 USPQ2d 1843, 1846 (Fed. Cir. 1989) (quoting In re Lamberti, 192 USPQ 278, 280 (CCPA 1976)). The point of Yoshikawa is that any vinyl-based polymer having appropriate properties would have been recognized by a person having ordinary skill in the art as being suitable for use as a toner binder resin in Yoshikawa's invention. In addition, as discussed in the rejection, Yoshikawa provides examples of useful vinyl-based polymers, e.g., ethylene-based copolymers and alicyclic hydrocarbon resins, both of which encompass the Minami low molecular weight ethylene-cycloolefin copolymers. Similarly, the fact that Minami discloses that the low molecular weight ethylene-cycloolefin copolymers of its invention have a multitude of uses does not detract from Minami's teaching that its low molecular weight ethylene-

cycloolefin copolymers are useful as toners.

The teaching that a polymer having certain properties is useful as an electrophotographic toner is a teaching that, absent indications to the contrary, any polymer having such properties would be useful for that purpose. The teaching that a polymer has properties suitable for a well-understood application such as a binder resin for electrophotographic toners is not lessened by the disclosure that the polymer is useful for other applications. Even without that express teaching, a person having ordinary skill in the art would have recognized from the properties disclosed by Minami for its low molecular weight ethylene-cycloolefin copolymers that they would have been useful as toner binder resins. For appellant's efforts to label the examiner's reasoning as hindsight to be successful, appellant must ignore the ability of the person having ordinary skill in the toner art to recognize that polymers having certain properties are reasonably expected to be useful as toners. Compare In re Sovish, 226 USPQ 771, 774 (Fed. Cir. 1985) (It is improper to assume less than ordinary skill). The instantly claimed subject matter is a clear instance of when the knowledge of those skilled in the art, the teachings of the prior art, and the "nature of the problem to be solved" provide the necessary motivation to combine the references. In re

Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("[E]vidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved.")

Appellant's separate arguments with respect to claim 28 (see the Brief at pages 13-14), claims 26, 27, and 29 (see the Brief at pages 14-15), and claim 30 (see the Brief at pages 15-16), differ only in the identification of particular monomers required in the alpha-olefin–alicyclic copolymers recited in those claims. In each case, appellant urges that the references provide insufficient motivation to select the particular monomers required. For the reasons given in the rejection and explained again immediately supra, Yoshikawa and Minami, considered as wholes, from the point of view of the person having ordinary skill in the electrophotographic toner art, provide the requisite motivation to establish a prima facie case of obviousness.

Accordingly, the examiner's rejection for obviousness over Yoshikawa and Minami should be affirmed.

(B) Claim 28

Appellant asserts that none of the eighteen examples of binder resins in Yoshikawa use a copolymer having an alicyclic compound having one double bond and an alpha-olefin selected from the group consisting of ethylene, propylene, and butylene, as recited in instant claim 28. Appellant asserts that there is no reason to selectively pick a copolymer as recited in instant claim 28 from those eighteen examples of binders.

However, the rejection of claim 28 is over the combined teachings of Yoshikawa and Minami. As discussed in the rejection, Minami teaches low molecular weight ethylene-cycloolefin copolymers useful as electrophotographic toners. For the reasons discussed in item (A) supra, which are incorporated herein by reference, Yoshikawa and Minami, considered as wholes, from the point of view of the person having ordinary skill in the electrophotographic toner art, provide the requisite motivation to establish a prima facie case of obviousness.

Accordingly, the examiner's rejection for obviousness over Yoshikawa and Minami should be affirmed.

(C) Claims 26, 27, and 29

Appellant asserts that none of the eighteen examples of binder resins in Yoshikawa use a copolymer having the alicyclic compound cyclohexene or norbornene and an alpha-olefin selected from the group consisting of ethylene, propylene, and butylene, as recited in the instant claims. Appellant asserts that there is no reason to selectively pick a copolymer as recited in the instant claims from those eighteen examples of binders.

However, the rejection of claims 26, 27, and 29 is over the combined teachings of Yoshikawa and Minami. As discussed in the rejection, Minami teaches low molecular weight ethylene-norbornene copolymers useful as electrophotographic toners. For the reasons discussed in item (A) supra, which are incorporated herein by reference, Yoshikawa and Minami, considered as wholes, from the point of view of the person having ordinary skill in the electrophotographic toner art, provide the requisite motivation to establish a prima facie case of obviousness.

Accordingly, the examiner's rejection for obviousness over Yoshikawa and Minami should be affirmed.

(D) Claim 30

Appellant asserts that none of the eighteen examples of binder resins in Yoshikawa use a copolymer having the alicyclic compound norbornene and the alpha-olefin ethylene as recited in instant claim 30. Appellant asserts that there is no reason to selectively pick a copolymer as recited in instant claim 30 from those eighteen examples of binders.

However, the rejection of claim 30 is over the combined teachings of Yoshikawa and Minami. As discussed in the rejection, Minami teaches low molecular weight ethylene-norbornene copolymers useful as electrophotographic toners. For the reasons discussed in item (A) supra, which are incorporated herein by reference, Yoshikawa and Minami, considered as wholes, from the point of view of the person having ordinary skill in the electrophotographic toner art, provide the requisite motivation to establish a prima facie case of obviousness.

Accordingly, the examiner's rejection for obviousness over Yoshikawa and Minami should be affirmed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

JANIS L. DOTE
PRIMARY EXAMINER
GROUP ~~1500~~ 1700

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Apr. 11, 2006

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